



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/982,317

10/18/2001

Arnab Das

129250-002120/US

6605

32498

7590

08/10/2007

CAPITOL PATENT & TRADEMARK LAW FIRM, PLLC

ATTN: JOHN CURTIN

P.O. BOX 1995

VIENNA, VA 22183

EXAMINER

MERED, HABTE

ART UNIT

PAPER NUMBER

2616

MAIL DATE

DELIVERY MODE

08/10/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/982,317

Applicant(s)

DAS ET AL

Examiner

Habte Mered

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/25/2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8,11-14 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,11-14 and 17-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/18/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. In view of the appeal brief filed on 4/25/2007, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37.

The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below.

2. Claims 1-6, 8, 11-14, and 17-19 are pending.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2616

6. **Claims 1-5, 8, 11-14, and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry et al (US 6, 996, 082), hereinafter referred to as Terry, in view of Odenwalder et al (US 6, 804, 220), hereinafter referred to as Odenwalder.

Terry discloses a method and apparatus for allocating resources in hybrid TDMA communication Systems.

7. Regarding **claims 1 and 14**, Terry discloses a method for transmitting information in a communication channel of a wireless communication system, the method comprising: dividing the communication channel into a plurality of time slots of equal duration according to a time division multiple access scheme (**See Figure 1 and Column 25-35 and in Figure 4 S1...S12 are timeslots and CDMA codes 0...15 defining the sub-slots**) and sub-dividing, on other than a time division basis, each of the plurality of time slots to comprise two or more sub-slots according to CDMA scheme, wherein each of the two or more sub-slots, and transmitting two or more contiguous sub-slots to form a separate transmission (**See Figure 4, each timeslot S1...S12 is sub-divided into sub slots using code 0...15 and UE A, UE B and UE C form different transmission using two or more contiguous sub slots**) Terry also disclose transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with two time slots, where the number of sub-slots included in the transmission from each timeslot may vary from timeslot to timeslot. (**See Figure 8 sub slots allotted for UE A, UE B, and UE C**)

Terry, however, fails to expressly disclose a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots.

Odenwalder teaches a method and apparatus for generating control information for packet data and sending it on a control channel useful for various applications including CDMA (See Column 4, Lines 13-23)

Odenwalder discloses a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots. **(See Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-26)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Terry's method to incorporate a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots. The motivation being such use of control channel technique reduces overhead and increases system resources for user data traffic since no additional new CDMA/Walsh codes will be needed to prevent interference in the different sub-slots associated with different transmission in the control channel which is further illustrated in Odenwalder in Column 1, Lines 53-67.

8. Regarding **claims 2**, Terry discloses a method, wherein each of the two or more contiguous sub-slots is separately transmitted according to a code division multiple access schemes. **(See Columns 2:64-67 and 3:1-10)**

Art Unit: 2616

9. Regarding **claim 3**, Terry discloses a method wherein, in any one of the plurality of time slots, each of a plurality of transmissions are separately coded and carried in a separate sub-slot simultaneously in such time slot. **(See Columns 2:64-67 and 3:1-10)**

10. Regarding **claim 4**, Terry discloses a method wherein each of the plurality of transmissions corresponds to a separate user of the wireless communication system. **(See Figures 4-10, UE A, UE B, UE C are separate users. See Columns 2:64-67 and 3:1-10)**

11. Regarding **claim 5**, Terry discloses a method wherein each of the plurality of transmissions corresponds to separate transmissions of a single user of the wireless communication system. **(See Figures 4-10, UE A, UE B, UE C are separate users with multiple sub-slots transmission. See Columns 2:64-67 and 3:1-10)**

12. Regarding **claim 8**, Terry discloses a method, wherein the communication channel comprises time slots each having duration of 1.25 milliseconds and wherein each of the time slots comprises at least two sub-slots. **(Terry discloses in Figure 5B and further on Column 6, Lines 39-43 that each time slot can have several sub-channels. There is no restriction imposed on the duration of the time slot and can readily be 1.25 milliseconds and 1.25 millisecond duration is standard for TDMA systems.)**

13. Regarding **claim 11**, Terry discloses all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method wherein the communication channel is a forward packet data channel (F-PDCH), wherein information is transmitted as encoder packets in the forward packet data channel (F-PDCH), and wherein the

separate control channel is a forward secondary packet data control channel (SPDCCH).

Odenwalder discloses a method wherein the communication channel is a forward packet data channel (F-PDCH), wherein information is transmitted as encoder packets in the forward packet data channel (F-PDCH), and wherein the separate control channel is a forward secondary packet data control channel (SPDCCH). **(See Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35)**

14. Regarding **claim 12**, Terry teaches all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein the forward secondary packet data control channel (SPDCCH) includes:

- a sub-slot start field for identifying a sub-slot within a time slot in which a particular transmission starts; and

- a sub-slot count field for identifying the total number of sub-slots that carry the particular transmission.

Odenwalder discloses a method, wherein the forward secondary packet data control channel (SPDCCH) includes:

- a sub-slot start field for identifying a sub-slot within a time slot in which a particular transmission starts; and

- a sub-slot count field for identifying the total number of sub-slots that carry the particular transmission. **(Odenwalder's system has to have a sub-slot count and start fields because it has to convey to the end user the number of sub-slots assigned to the user and where the number of sub-slots are and this particular**

inherency is chronicled in Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35.)

15. Regarding **claim 13**, Terry teaches all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein a plurality of forward secondary packet data control channels (SPDCCH) correspond to a plurality of simultaneous transmissions on the forward packet data channel (F-PDCH), and wherein each of the plurality of secondary packet data control channels (SPDCCH) identifies a sub-slot start position within a time slot in which a particular transmission starts.

Odenwalder discloses a method, wherein a plurality of forward secondary packet data control channels (SPDCCH) correspond to a plurality of simultaneous transmissions on the forward packet data channel (F-PDCH), and wherein each of the plurality of secondary packet data control channels (SPDCCH) identifies a sub-slot start position within a time slot in which a particular transmission starts. **(Odenwalder's system has to have a sub-slot count and start fields because it has to convey to the end user the number of sub-slots assigned to the user and the nature of this inherency is chronicled in Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35.)**

16. With respect to **claims 11-13**, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Terry's method by including a forward packet data channel (F-PDCH), a forward secondary packet data control channel (SPDCCH), wherein the forward secondary packet data control channel (SPDCCH) includes a sub-slot count and start fields. The motivation being such use of

Art Unit: 2616

control channel technique reduces overhead and increases system resources for user data traffic since no additional new CDMA/Walsh codes will be needed to prevent interference in the different sub-slots associated with different transmission in the control channel which is further illustrated in Odenwalder in Column 1, Lines 53-67.

17. Regarding **claim 17**, Terry discloses a method, wherein bandwidth in the communication channel is allocated on a fractional basis to carry a plurality of transmissions using a combination of a variable number of contiguous sub-slots and a variable number of contiguous time slots. **(See Figures 4-8 and 13, See Columns 2:64-67 and 3:1-10)**

18. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Terry in view of Odenwalder as applied to claim 1 above, and further in view of Toskala et al (US 6, 535, 503).

The combination of Terry and Odenwalder, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) scheme.

Toskala like Terry discloses a method and apparatus for allocating resources in hybrid TDMA communication Systems. The hybrid TDMA system primarily described by both Toskala and Terry is TDMA/CDMA.

Toskala shows that TDMA/FDMA is feasible and further discloses a method, wherein each of the two or more sub-slots within a particular time slot corresponds to a

different frequency according to a frequency division multiple access (FDMA) schemes.

(See Column 1, Lines 40-50)

It would have been obvious to one of ordinary skill in the art at the time of invention to practice FDMA/TDMA access in Terry's method wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) schemes. One is motivated to use TDMA/FDMA in GSM systems as it is widely used in the international wireless market and GSM access method is based on both FDMA and TDMA.

19. **Claims 18 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry in view of Odenwalder as applied to claim 1 above; and further in view of Malkamaki et al (US 5, 577, 024), hereinafter referred to as Malkamaki.

20. Regarding **claim 18**, the combination of Koorapaty and Odenwalder, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions, retransmissions, acknowledgements (ACKs), negative acknowledgements (NACKs), and multi-level ACK/NACK messages.

Malkamaki discloses a TDMA/CDMA system similar to Koorapaty but further incorporates Automatic Repeat request (ARQ) transmission scheme.

Malkamaki discloses a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions, retransmissions, acknowledgements (ACKs), negative

Art Unit: 2616

acknowledgements (NACKs), and multi-level ACK/NACK messages. **(See Column 1, Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Since Malkamaki's system supports ARQ and also like Koorapaty's system allows sub-slots in a given time slot, it is possible to have 4 users sharing the time slot. Each user in the sub-slot can be sending new transmission, Acks, Nacks and multi-level ACK/NACK).**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Terry's and Odenwalder's method to incorporate orthogonal ARQ transmission, the motivation being implementing an error correction system for users in a TDMA/CDMA system.

21. Regarding **claim 19**, the combination of Terry and Odenwalder, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein a multi-level ACK/NACK message corresponds to multiple transmissions that end within the same time slot.

Malkamaki discloses disclose a method, wherein a multi-level ACK/NACK message corresponds to multiple transmissions that end within the same time slot. **(See Column 1, Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Malkamaki's system supports ARQ in an environment where multiple transmission within the same environment is allowed.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Terry's and Odenwalder's method to

incorporate orthogonal ARQ transmission, the motivation being implementing an error correction system for users in a TDMA/CDMA system.

Response to Arguments

22. Applicant's arguments filed on 4/25/07 have been fully considered but they are not persuasive.

23. In the Appeal Brief, in the Arguments Section VII, on page 4 with respect to claims 1 and 14, Applicant primarily argues that Odenwalder fails to teach separate control channels. Applicant further reiterates that in Odenwalder, "primary" and "secondary" control channels are consolidated. Applicant further responds to Examiner's request in previous Office Actions for a specific citation in Odenwalder where consolidated control channels are taught and Applicant responded by indicating it is in Column 6, lines 27-31.

Examiner respectfully disagrees with Applicant's position. The Examiner cited from Odenwalder Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35 to teach separate control channels. However a close review of these citations reveals that there are different exemplary embodiments involved in teaching control channel implementations. The embodiment that starts from column 6:9-27 teaches separate control channels and is supported by the basic description given in column 5:60-67. However, the citation provided by Applicant that starts in column 6 from line 27 to line 31 cites a different unrelated embodiment to the one cited by the Examiner.

24. In the Appeal Brief, in the Arguments Section VII, on page 5, Applicant primarily argues that Odenwalder does not teach or use subslots and is irrelevant. Applicant

further argues that there is a distinction between a subslot and a timeslot in that a system that has subslots in a timeslot has unique characteristics in that the number of subslots may be far greater than the number of timeslots.

Examiner respectfully disagrees with Applicant's position. The concept of dividing a timeslot into subslots using TDMA/CDMA techniques has already been taught by Terry, Odenwalder is simply introduced to show that it is well known in the art for control channel length to be variable and dependent on the number of transmitted timeslot/sub-slot. The Applicant position that the number of subslots is greater than the number of timeslots is universally true to any system that uses hybrid transmission scheme to subdivide the timeslots.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

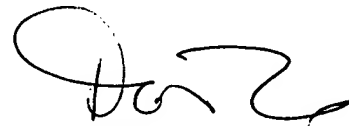
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris H. To can be reached on 571 272 7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2616

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HM

8-4-2007



DORIS H. TO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600